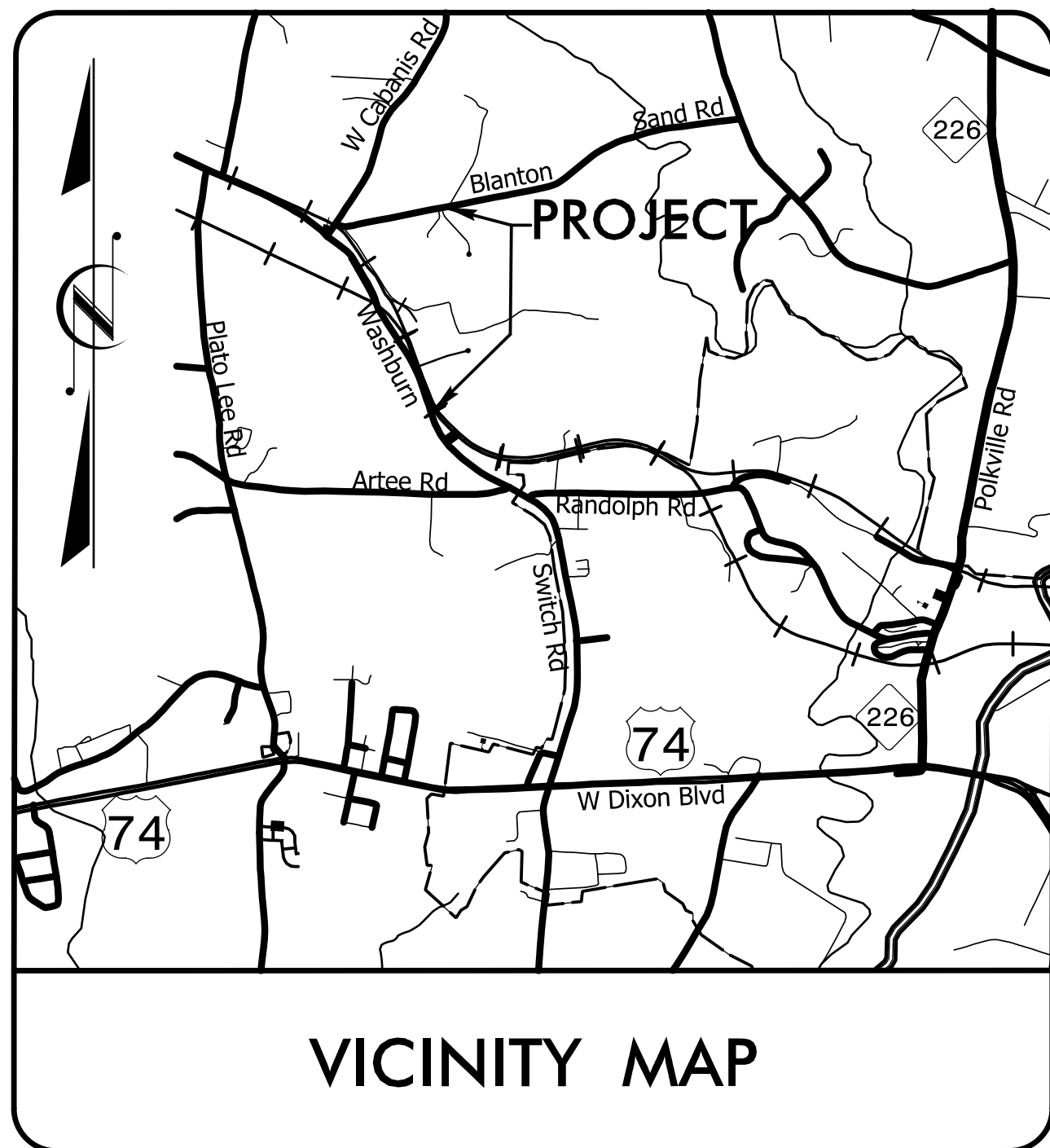


**TIP PROJECT: R-5849**

**CONTRACT:**

See Sheet 1A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA  
**CLEVELAND COUNTY**

**LOCATION: WASHBURN SWITCH BUSINESS PARK**  
**ADDITION OF TURN LANES ON SR 1313 (WASHBURN SWITCH RD) AND**  
**NEW INDUSTRIAL ENTRANCES TO WASHBURN SWITCH BUSINESS PARK**  
**TYPE OF WORK: GRADING, DRAINAGE, AND PAVING**

STATE	PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5849	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47406.1.1	N/A	PE	
47406.2.1	N/A	RW & UTIL	
47406.3.1	N/A	CONST	

**BEGIN CONSTRUCTION**  
-Y2- STA. 10 + 08.85

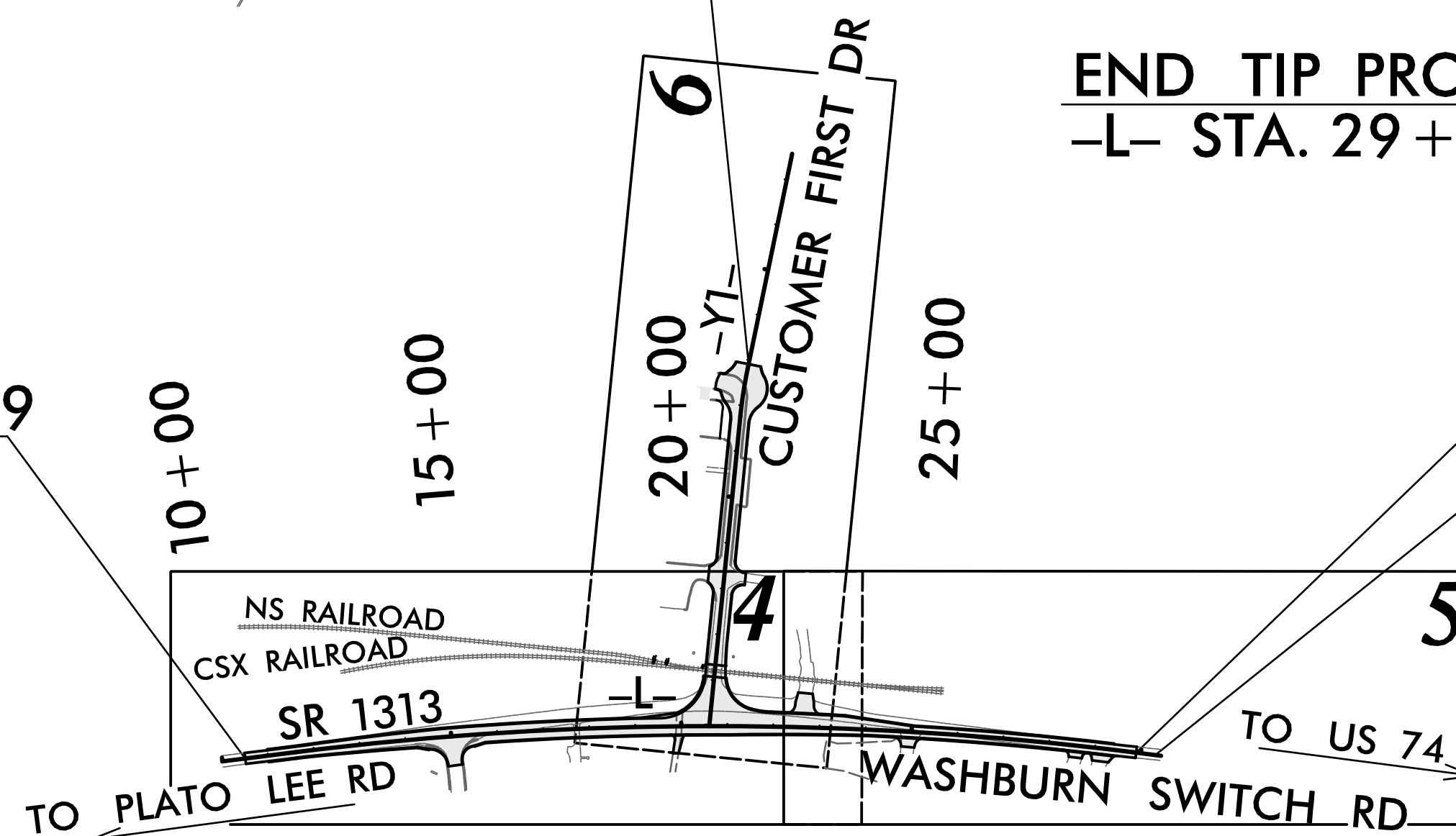
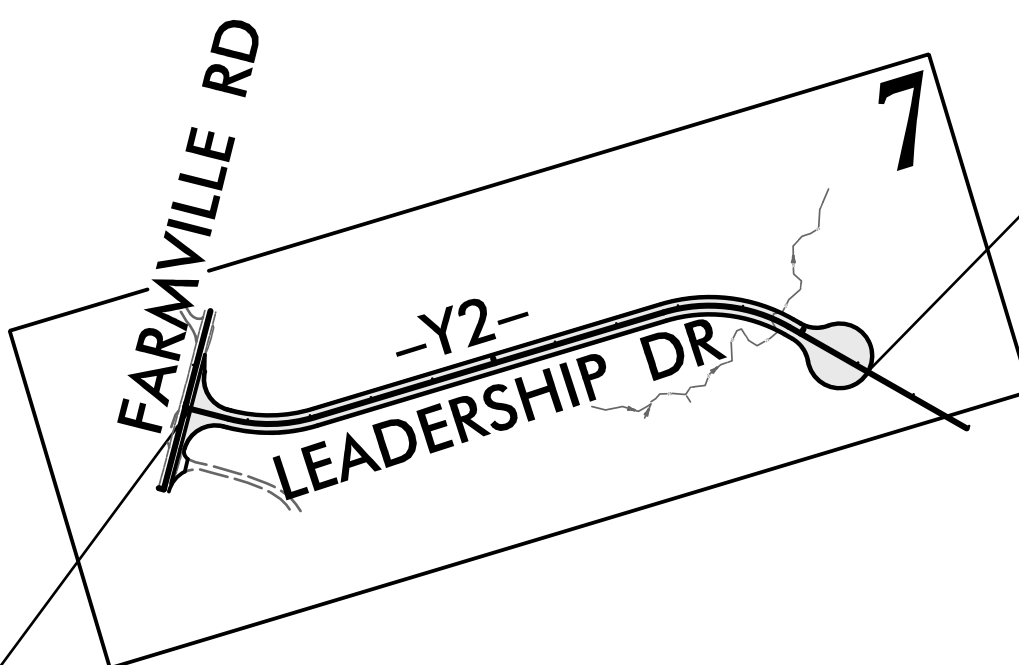
**BEGIN TIP PROJECT R-5849**  
-L- STA. 10 + 50.00

**END CONSTRUCTION**  
-Y2- STA. 21 + 20.00

**END CONSTRUCTION**  
-Y1- STA. 17 + 91.00

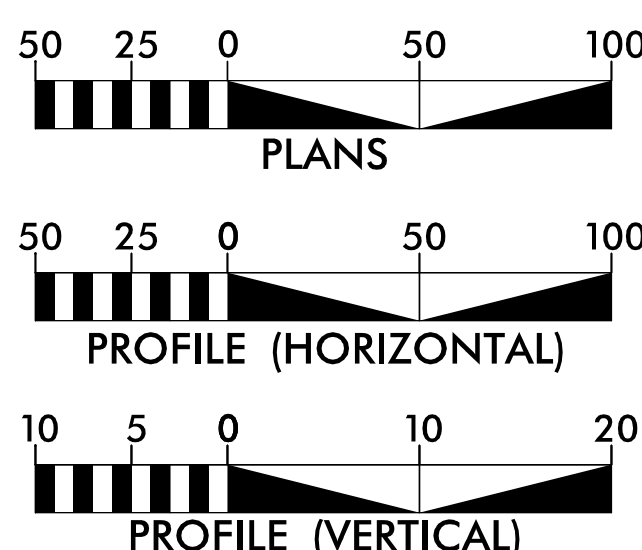
**END TIP PROJECT R-5849**  
-L- STA. 29 + 90.00

**END CONSTRUCTION**  
-L- STA. 30 + 32.00



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2018 = 6200 (-L-)  
K = 11 %  
D = 55 %  
T = 11 % \*  
\* TTST = 5% DUAL = 6%  
V = 50 MPH (-L-)  
V = 35 MPH (-Y- LINES)  
FUNC CLASS =  
RURAL COLLECTOR (-L-)  
RURAL LOCAL (Y-LINES)

**PROJECT LENGTH**

LENGTH ROADWAY PROJECT -L- = 0.367 MILES  
LENGTH ROADWAY PROJECT -Y1- = 0.144 MILES  
LENGTH ROADWAY PROJECT -Y2- = 0.210 MILES  
  
LENGTH TOTAL PROJECT = 0.721 MILES

**CONTACT: MATT BLACKWELL**

**PLANS PREPARED BY:**  
TGS ENGINEERS  
804-C N. LAFAYETTE ST  
SHELBY, NC 28150  
PH (704) 476-0003  
CORP. LICENSE NO.: C-0275

**PLANS PREPARED FOR:**  
CLEVELAND COUNTY  
NORTH CAROLINA  
  
1800 E. Marlon St  
Shelby, NC 28152

**RIGHT OF WAY DATE:**  
SEPT. 15, 2017

**JIMMY L. TERRY, PE**  
PROJECT ENGINEER

**LETTING DATE:**  
JAN. 18, 2018

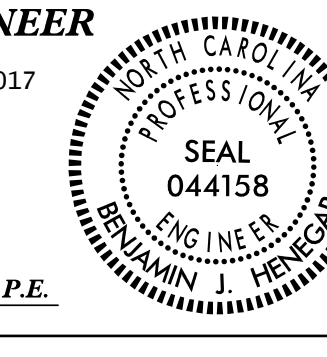
**SANDRA G. MELVIN**  
PROJECT DESIGN ENGINEER

2018 STANDARD SPECIFICATIONS

**HYDRAULICS ENGINEER**

11/14/2017

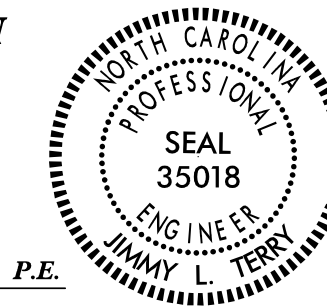
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Benjamin J Henegar  
11/22/2017 11:48:09  
SIGNATURE:

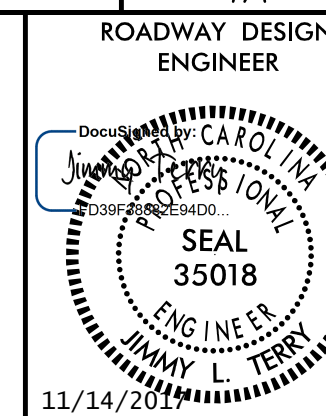


**ROADWAY DESIGN ENGINEER**

11/14/2017

DocuSigned by:  
Jimmy Terry  
11/22/2017 11:48:09  
SIGNATURE:





**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

# INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
1C-1	SURVEY CONTROL SHEETS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
3B-1	ROADWAY SUMMARIES
3D-1 THRU 3D-3	DRAINAGE SUMMARIES
3G-1	GEOTECHNICAL SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 7	PLAN AND PROFILE SHEET
TMP-1 THRU TMP-4	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-3	PAVEMENT MARKING PLANS
EC-1 THRU EC-12	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-4	SIGNING PLANS
UC-1 THRU UC-8	UTILITIES CONSTRUCTION PLANS
UO-1 THRU UO-4	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION INDEX SHEET
X-1B	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-15	CROSS-SECTIONS

# GENERAL NOTES

**GENERAL NOTES:**

2018 SPECIFICATIONS  
EFFECTIVE: 01-16-2018  
REVISED:

**GRADE LINE:  
GRADING AND SURFACING:**

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

**CLEARING:**

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

**SUPERELEVATION:**

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

**SHOULDER CONSTRUCTION:**

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

**SIDE ROADS:**

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

**SUBSURFACE DRAINS:**

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

**STREET TURNOUT:**

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

**TEMPORARY SHORING:**

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

**UTILITIES:**

UTILITY OWNERS ON THIS PROJECT ARE DUKE ENERGY, SPECTRUM, AT&T AND CITY OF SHELBY GAS, WATER AND SEWER

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

# STANDARD DRAWINGS

2018 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 01-16-2018  
REV.

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
<b>DIVISION 2 - EARTHWORK</b>	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
<b>DIVISION 3 - PIPE CULVERTS</b>	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
<b>DIVISION 6 - ASPHALT BASES AND PAVEMENTS</b>	
654.01	Pavement Repairs
<b>DIVISION 8 - INCIDENTALS</b>	
815.02	Subsurface Drain
838.27	Reinforced Concrete Endwall - for Single 60" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.57	Reinforced Brick Endwall - for Single 60" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad for Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.45	Precast Drainage Structure
840.51	Brick Manhole - 12" thru 36" Pipe
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets

# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

### BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	○ EIP
Computed Property Corner	_____ X
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-X-X-X-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	--- WLB ---
Proposed Wetland Boundary	--- WLB ---
Existing Endangered Animal Boundary	--- EAB ---
Existing Endangered Plant Boundary	--- EPB ---
Existing Historic Property Boundary	--- HPB ---
Known Contamination Area: Soil	☠ S ☠
Potential Contamination Area: Soil	☠ S ☠
Known Contamination Area: Water	☠ W ☠
Potential Contamination Area: Water	☠ W ☠
Contaminated Site: Known or Potential	☠ ?

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	⊗
Foundation	□
Area Outline	□
Cemetery	□
Building	□
School	□
Church	□
Dam	▬

### HYDROLOGY:

Stream or Body of Water	_____
Hydro, Pool or Reservoir	_____
Jurisdictional Stream	--- JS ---
Buffer Zone 1	--- BZ 1 ---
Buffer Zone 2	--- BZ 2 ---
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	▽
Proposed Lateral, Tail, Head Ditch	▬
False Sump	▽

### RAILROADS:

Standard Gauge	_____
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	_____
RR Dismantled	_____

### RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	◆
Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	●
Exist Permanent Easement Pin and Cap	◇
New Permanent Easement Pin and Cap	◆
Vertical Benchmark	⊠
Existing Right of Way Marker	△
Existing Right of Way Line	_____
New Right of Way Line	_____
New Right of Way Line with Pin and Cap	_____
New Right of Way Line with Concrete or Granite R/W Marker	_____
New Control of Access Line with Concrete C/A Marker	_____
Existing Control of Access	_____
New Control of Access	_____
Existing Easement Line	--- E ---
New Temporary Construction Easement	--- E ---
New Temporary Drainage Easement	--- TDE ---
New Permanent Drainage Easement	--- PDE ---
New Permanent Drainage / Utility Easement	--- DUE ---
New Permanent Utility Easement	--- PUE ---
New Temporary Utility Easement	--- TUE ---
New Aerial Utility Easement	--- AUE ---

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	_____
Existing Curb	_____
Proposed Slope Stakes Cut	--- C ---
Proposed Slope Stakes Fill	--- F ---
Proposed Curb Ramp	_____
Existing Metal Guardrail	_____
Proposed Guardrail	_____
Existing Cable Guiderail	_____
Proposed Cable Guiderail	_____
Equality Symbol	⊕
Pavement Removal	▨

### VEGETATION:

Single Tree	☼
Single Shrub	☼

Note: Not to Scale \*S.U.E. = Subsurface Utility Engineering

Hedge	_____
Woods Line	_____
Orchard	_____
Vineyard	_____

### EXISTING STRUCTURES:

MAJOR: Bridge, Tunnel or Box Culvert	_____
Bridge Wing Wall, Head Wall and End Wall	_____
MINOR: Head and End Wall	_____
Pipe Culvert	_____
Footbridge	_____
Drainage Box: Catch Basin, DI or JB	_____
Paved Ditch Gutter	_____
Storm Sewer Manhole	_____
Storm Sewer	_____

### UTILITIES:

POWER: Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊠
Power Transformer	⊠
U/G Power Cable Hand Hole	_____
H-Frame Pole	●
U/G Power Line LOS B (S.U.E.*)	_____
U/G Power Line LOS C (S.U.E.*)	_____
U/G Power Line LOS D (S.U.E.*)	_____

### TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊠
Telephone Cell Tower	⊠
U/G Telephone Cable Hand Hole	_____
U/G Telephone Cable LOS B (S.U.E.*)	_____
U/G Telephone Cable LOS C (S.U.E.*)	_____
U/G Telephone Cable LOS D (S.U.E.*)	_____
U/G Telephone Conduit LOS B (S.U.E.*)	_____
U/G Telephone Conduit LOS C (S.U.E.*)	_____
U/G Telephone Conduit LOS D (S.U.E.*)	_____
U/G Fiber Optics Cable LOS B (S.U.E.*)	_____
U/G Fiber Optics Cable LOS C (S.U.E.*)	_____
U/G Fiber Optics Cable LOS D (S.U.E.*)	_____

### WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	_____
U/G Water Line LOS C (S.U.E.*)	_____
U/G Water Line LOS D (S.U.E.*)	_____
Above Ground Water Line	_____

### TV:

TV Pedestal	⊠
TV Tower	⊗
U/G TV Cable Hand Hole	_____
U/G TV Cable LOS B (S.U.E.*)	_____
U/G TV Cable LOS C (S.U.E.*)	_____
U/G TV Cable LOS D (S.U.E.*)	_____
U/G Fiber Optic Cable LOS B (S.U.E.*)	_____
U/G Fiber Optic Cable LOS C (S.U.E.*)	_____
U/G Fiber Optic Cable LOS D (S.U.E.*)	_____

### GAS:

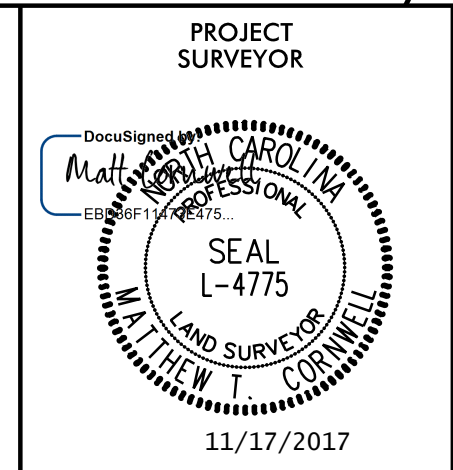
Gas Valve	◇
Gas Meter	⊕
U/G Gas Line LOS B (S.U.E.*)	_____
U/G Gas Line LOS C (S.U.E.*)	_____
U/G Gas Line LOS D (S.U.E.*)	_____
Above Ground Gas Line	_____

### SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	_____
Above Ground Sanitary Sewer	_____
SS Forced Main Line LOS B (S.U.E.*)	_____
SS Forced Main Line LOS C (S.U.E.*)	_____
SS Forced Main Line LOS D (S.U.E.*)	_____

### MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line LOS B (S.U.E.*)	_____
U/G Tank; Water, Gas, Oil	_____
Underground Storage Tank, Approx. Loc.	⊠
A/G Tank; Water, Gas, Oil	_____
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	_____
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.



# SURVEY CONTROL SHEET

## W/ PROPOSED CENTERLINE ALIGNMENTS



**DATUM DESCRIPTION**

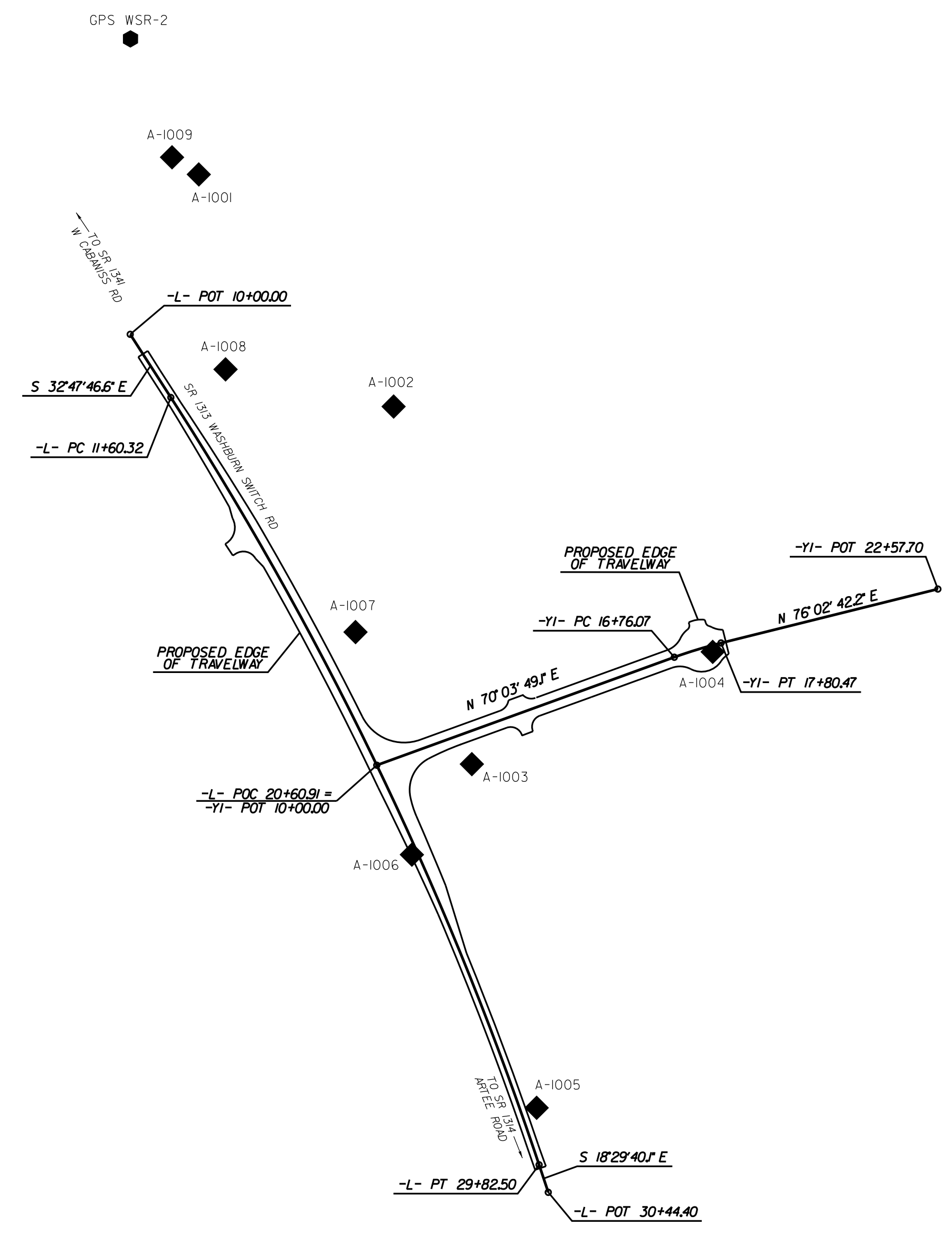
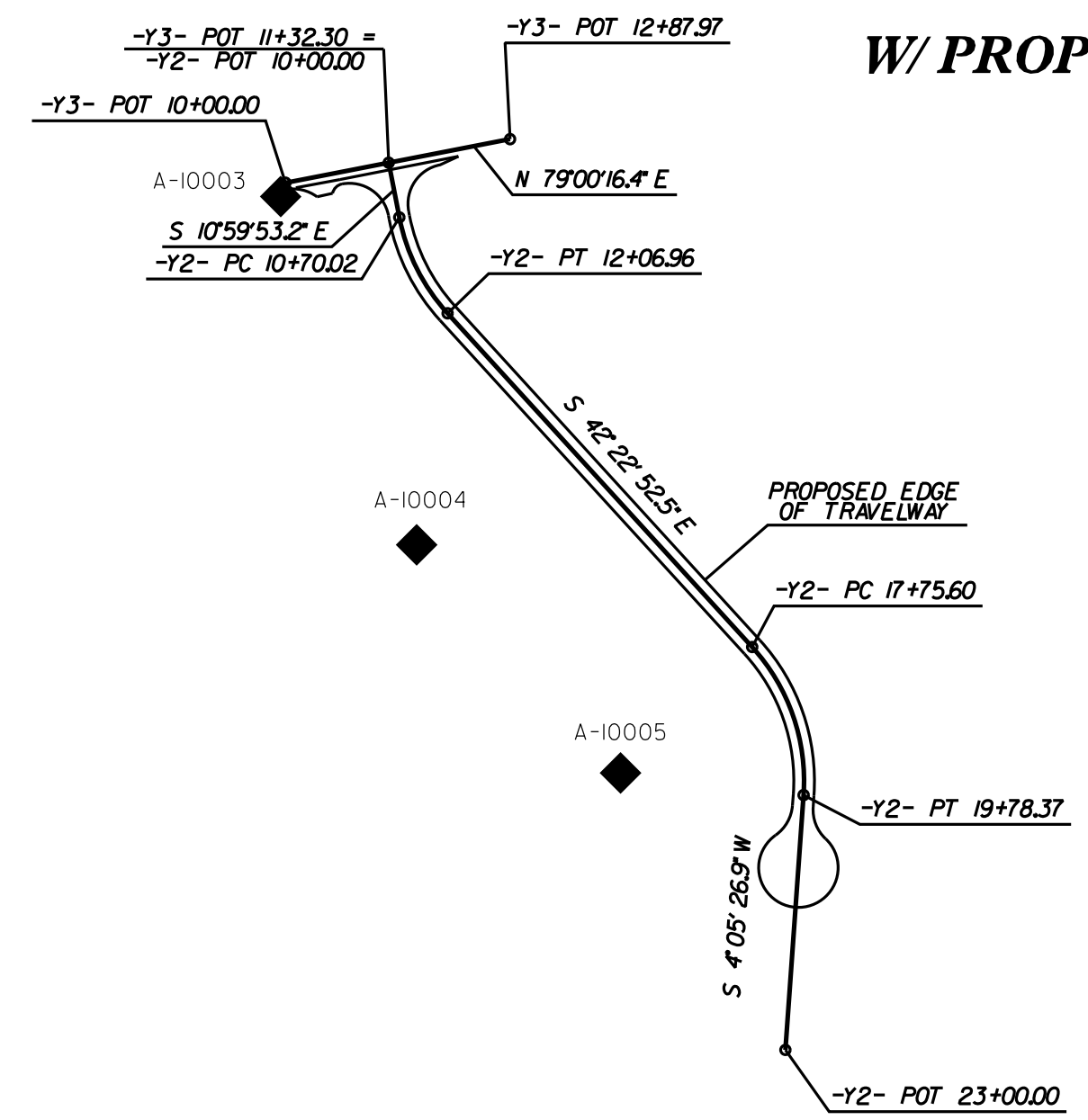
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY TGS ENGINEERS FOR MONUMENT "GPS-2"

WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF  
 NORTHING: 581449.1601(ft) EASTING: 1221648.349(ft)  
 ELEVATION: 902.00(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99986102

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS-2" TO -L- STATION 10+00.00 IS  
 S 00°03'00.2" W 630.87'

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88



## BASELINE

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
	1005	A-1005	579166.7824	1222515.9244	887.74	28+65.98	34.50 LT
	1006	A-1006	579707.2027	1222249.3705	889.16	22+65.97	12.72 RT
	1007	A-1007	580182.5414	122128.9698	884.02	17+88.30	87.43 LT
	1008	A-1008	580743.4471	1221851.3625	894.21	11+72.95	130.59 LT
	1009	A-1009	581196.2638	1221736.9902	901.55		OUTSIDE PROJECT LIMITS
	2	GPS WSR-2	581449.1600	1221648.3490	902.00		OUTSIDE PROJECT LIMITS
	1	GPS WSR-1	582061.3330	1221229.2970	915.73		OUTSIDE PROJECT LIMITS

BY	POINT	DESC.	NORTH	EAST	ELEVATION	Y1 STATION	OFFSET
	1006	A-1006	579707.2027	1222249.3705	889.16	10+05.14	205.20 RT
	1003	A-1003	579900.5643	1222377.4780	889.14	11+91.50	67.11 RT
	1004	A-1004	580140.2280	1222892.0365	892.22	17+58.18	13.94 RT

BY1	POINT	DESC.	NORTH	EAST	ELEVATION	Y2 STATION	OFFSET
	1	GPS WSR-1	582061.3330	1221229.2970	915.73	11+38.65	1737.12 RT
	10001	A-10001	582579.5227	1220869.6012	926.93	10+31.39	1916.95 RT
	10002	A-10002	582809.4627	1221740.8145	920.46		OUTSIDE PROJECT LIMITS
	10003	A-10003	582933.3619	1222609.2785	894.85	10+15.94	141.72 RT
	10004	A-10004	582495.0318	1222780.4012	868.65	13+95.93	225.31 RT
	10005	A-10005	582287.8250	1223036.9098	836.85	18+39.62	228.73 RT

**NOTES:**

- IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

REVISIONS

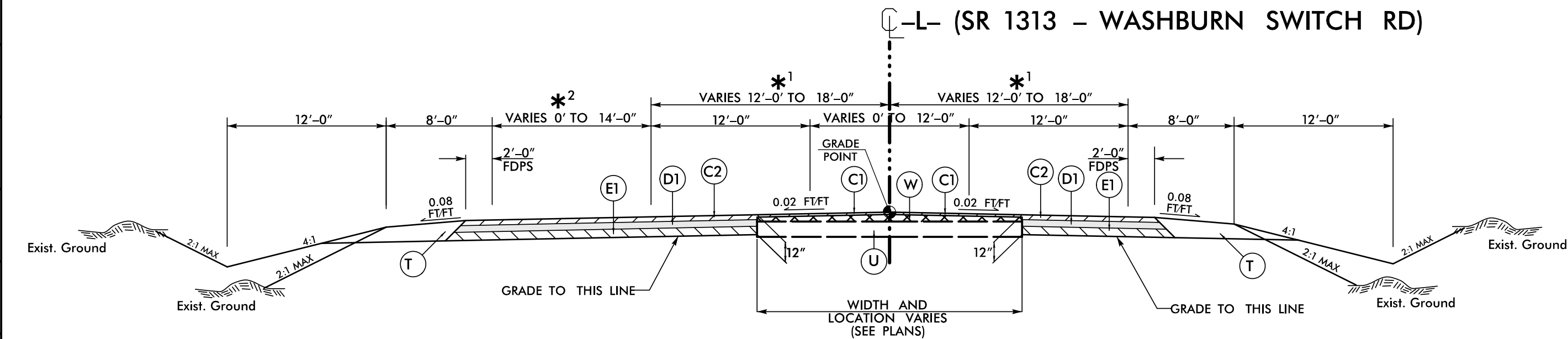
6/2/2017

PROJECT REFERENCE NO. <b>R-5849</b>	SHEET NO. <b>2A-1</b>
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

## PAVEMENT SCHEDULE

C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.
J1	8" AGGREGATE BASE COURSE
R1	2'-6" CONCRETE CURB AND GUTTER.
R2	8" X 12" CONCRETE CURB
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING EXISTING PAVEMENT, SEE THIS SHEET FOR DETAIL
W	WEDGING EXISTING PAVEMENT, SEE THIS SHEET FOR DETAILS

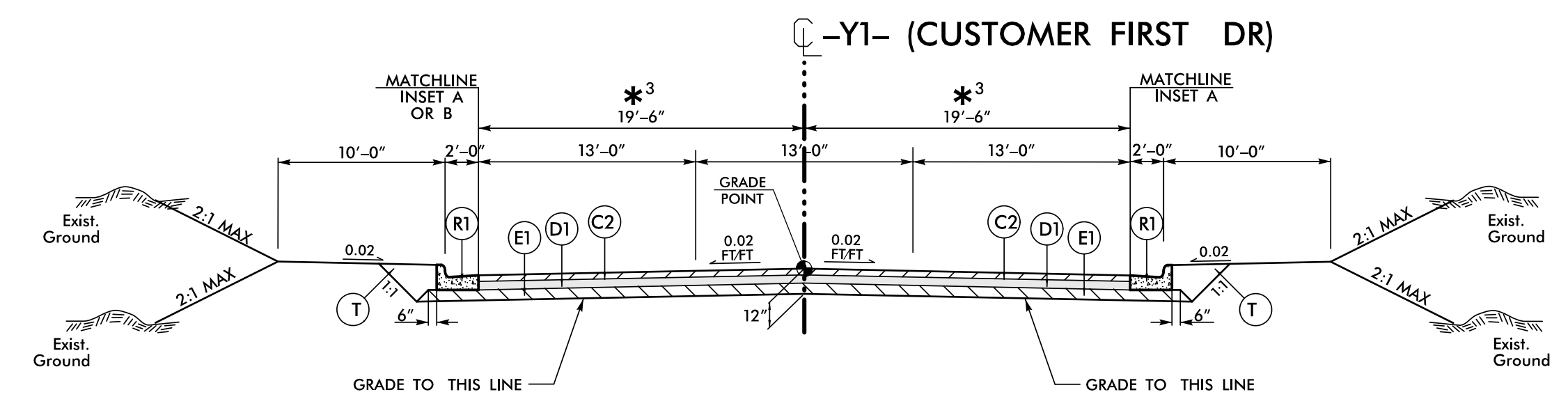
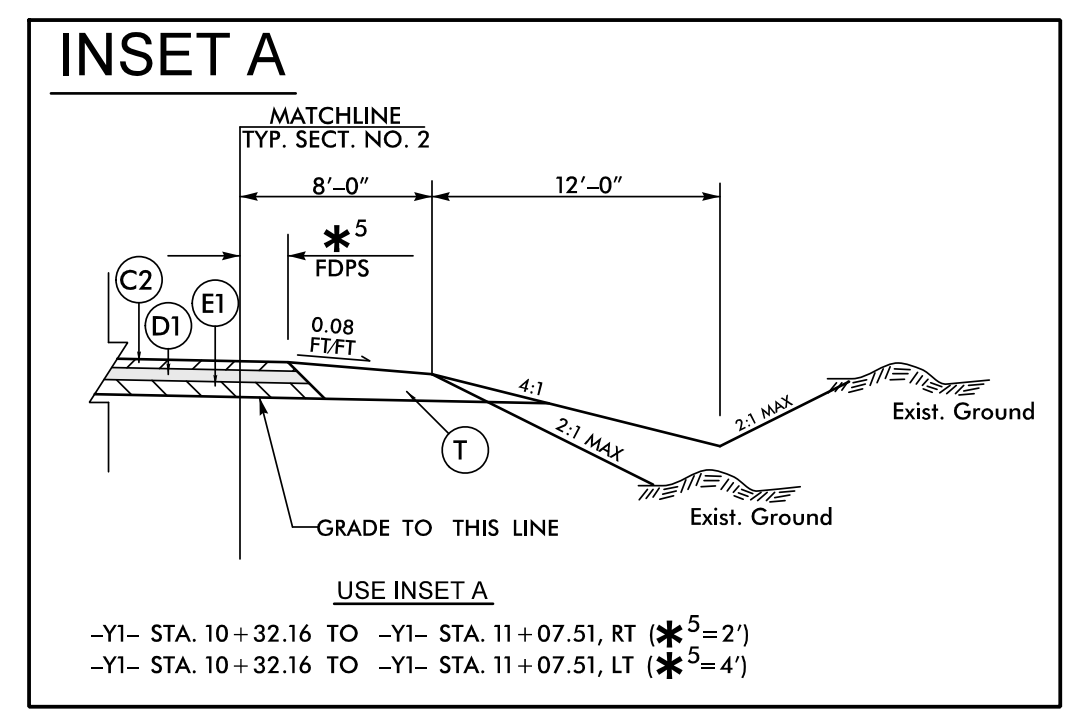
PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



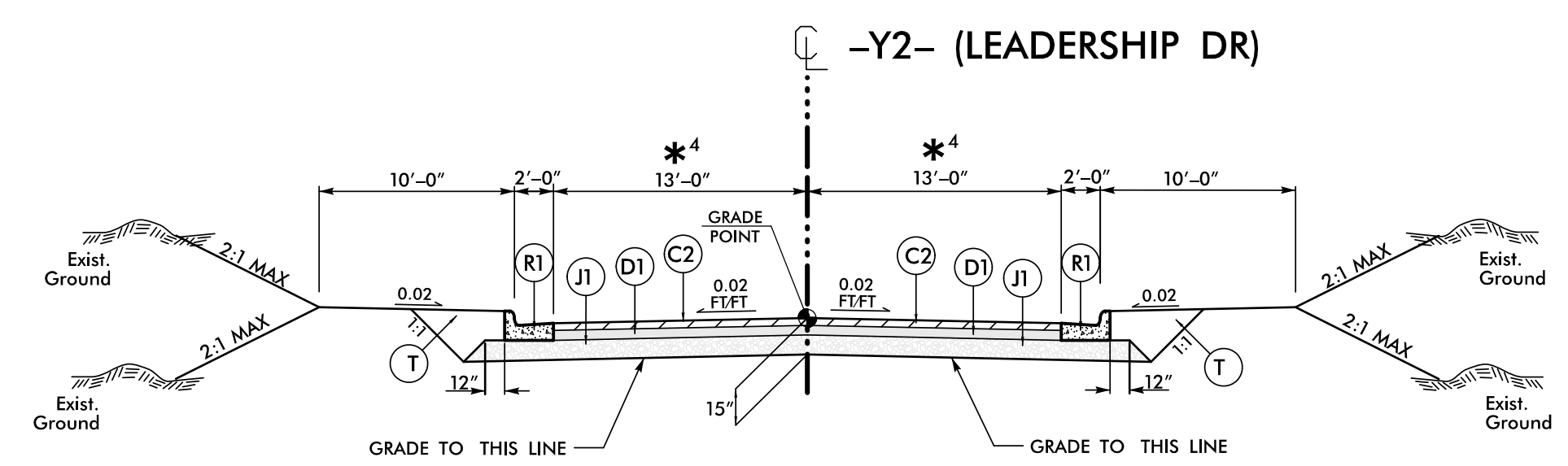
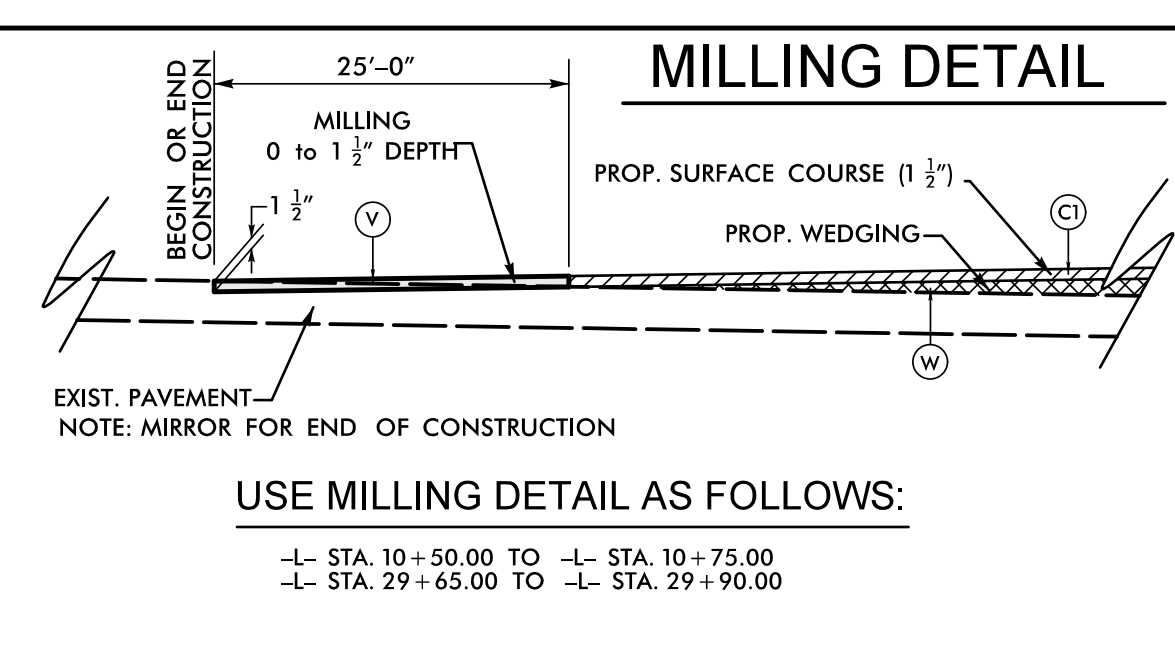
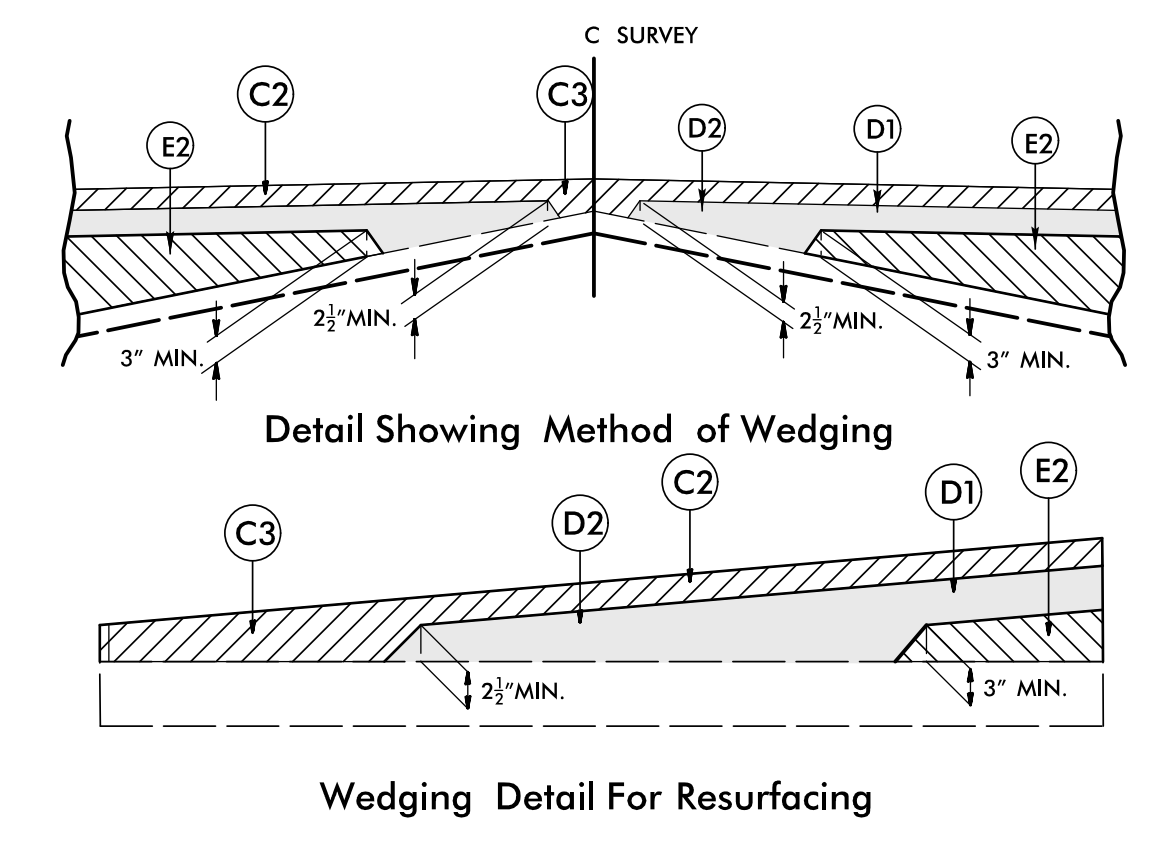
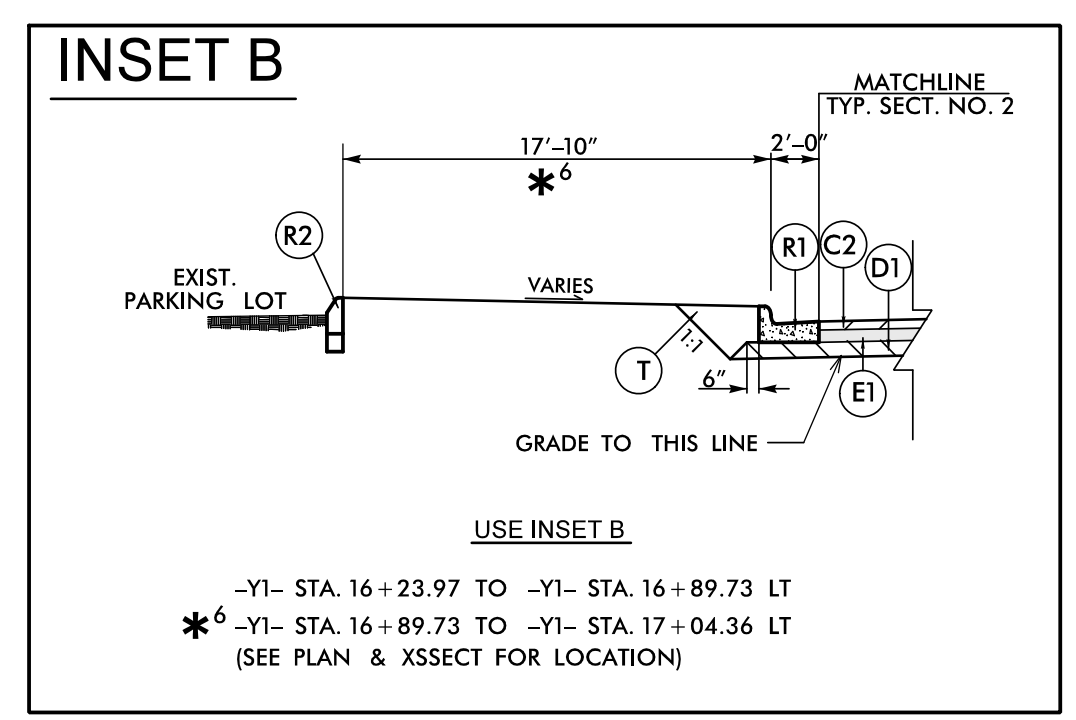
NOTE: TRANSITION BETWEEN EXISTING AND TYP. SECT. NO. 1 AS FOLLOWS:  
 -L- STA. 10+50.00 TO -L- STA. 11+00.00  
 -L- STA. 29+40.00 TO -L- STA. 29+90.00

USE TYPICAL SECTION NO. 1

*2	STA. TO STA.	*1	STA. TO STA.	
14'-0"	-L- STA. 21+47.55 TO -L- STA. 23+55.00	12'-0"	-L- STA. 11+00.00 TO -L- STA. 11+80.00	
14'-0" TO 0'	-L- STA. 23+55.00 TO -L- STA. 25+05.00	12'-0" TO 18'-0"	-L- STA. 11+80.00 TO -L- STA. 14+80.00	
		18'-0"	-L- STA. 21+05.00 TO -L- STA. 24+05.00	
			18'-0"	-L- STA. 14+80.00 TO -L- STA. 21+05.00



\*3 NOTE: CUL-DE-SAC FROM -Y1- STA 16+63.72 TO -Y1- STA. 17+91.00  
 SEE PLAN FOR PAVEMENT WIDTH.



\*4 NOTE: CUL-DE-SAC FROM -Y2- STA 19+92.34 TO -Y2- STA. 21+20.00  
 SEE PLAN FOR PAVEMENT WIDTH.

COMPUTED BY: SGM DATE: 10/5/2017  
 CHECKED BY: JLT DATE: 10/11/2017

PROJECT NO.	SHEET NO.
R-5849	3B-1

## STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

### SUMMARY OF EARTHWORK

IN CUBIC YARDS

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
-L- 10+50.00	-L- 29+90.00	3,991	4,388	397	
-Y1- 10+32.16	-Y1- 17+91.00	1,417	316		1,101
-Y2- 10+08.85	-Y2- 21+20.00	2,927	19,229	16,302	
<b>TOTALS:</b>		8,335	23,933	16,699	1,101
Material For Shoulder Construction			1,024	1,024	
Loss Due To Clearing & Grubbing		-300		300	
Waste In Lieu Of Borrow				-1,101	-1,101
<b>PROJECT TOTALS:</b>		8,035	24,957	16,922	0
Est. 5% to Replace Top Soil On Borrow Pit				846	
<b>GRAND TOTALS:</b>		8,035	24,957	17,768	0
<b>SAY:</b>		<b>8,300</b>		<b>18,400</b>	

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading".

Note: Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

EST. DDE = 2,400 CUBIC YARDS  
 PER GEOTECH RECOMMENDATION, EST. 1,900 CUBIC YARDS OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.  
 UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT IN THE TOP 3 FT OF EMBANKMENT (-Y2- 20+25 TO 21+20) = 1,500 CUBIC YARDS

### PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS

SURVEY LINE	Station	Station	LOCATION LT/RT/CL	ASPHALT REMOVAL	ASPHALT BREAKUP	CONCRETE REMOVAL	CONCRETE BREAKUP
-L-	10+50	20+48	LT	1,564.51			
-L-	21+02	22+52	LT	445.52			
-L-	22+83	29+90	LT	689.59			
-Y1-	10+32	17+60	CL	2,644.50			
<b>TOTAL:</b>				5,344.12			
<b>SAY:</b>				<b>5,350</b>			









COMPUTED BY: M. Brewer DATE: 6/27/17  
 CHECKED BY: M. Walko DATE: 6/27/17

(2-16-16)

PROJECT NO. R-5849	SHEET NO. 3G-1
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**STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS**

**SUMMARY OF SUBSURFACE DRAINAGE**

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	500
				<b>TOTAL LF:</b>	500

\*UD = Underdrain  
 \*BD = Blind Drain  
 \*SD = Subsurface Drain

**SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION**

LINE	Station	Station	SY
CONTINGENCY			
			<b>TOTAL SY:</b> 0

**SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION**

LINE	Station	Station	Aggregate Type* ASU/AST	Aggregate Thickness INCHES	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Soil Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU	12	750	1470	3100		
			<b>TOTAL CY/TONS/SY:</b>		750	1470	3100*	0	0

\*ASU = Aggregate Subgrade  
 \*AST = Aggregate Stabilization

**SUMMARY OF ROCK PLATING**

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
								<b>TOTAL SY:</b> 0

\*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

**SUMMARY OF REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL**

LINE	Beginning Slope/ RSS (H:V)	Approx. Station	Ending Slope/ RSS (H:V)	Approx. Station	Location LT/RT	Reinforced Soil Slope (RSS) SY	Geocells SY	Coir Fiber Mat SY	Matting for Erosion Control SY
						<b>TOTAL SY:</b>	0	0	0*

\*Total square yards of "Coir Fiber Mat" is only the estimated quantity for slopes steeper than 2:1 (H:V) and may only represent a portion of the coir fiber mat quantity shown in the Item Sheets of the Proposal.  
 \*\*Total square yards of "Matting for Erosion Control" is only the estimated quantity for RSS and may only represent a portion of the matting quantity shown in the Item Sheets of the Proposal.

**SUMMARY OF PRE-SPLITTING OF ROCK**

LINE	Beginning Rock Cut Slope (H:V)	Approx. Station	Ending Rock Cut Slope (H:V)	Approx. Station	Location LT/RT	Pre-splitting of Rock SY
						<b>TOTAL SY:</b> 0

**SUMMARY OF SURCHARGES AND SURCHARGE WAITING PERIODS**

LINE	Station	Station	Surcharge Height FT	MONTHS

**SUMMARY OF SETTLEMENT GAUGES**

Gauge No.	LINE and Station	Offset	
		Distance FT	Direction LT/RT
		<b>TOTAL GAUGES (EACH):</b>	

**SUMMARY OF EMBANKMENT WAITING PERIODS**

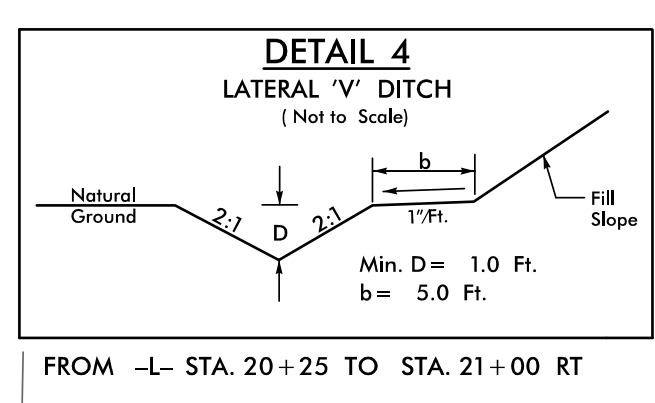
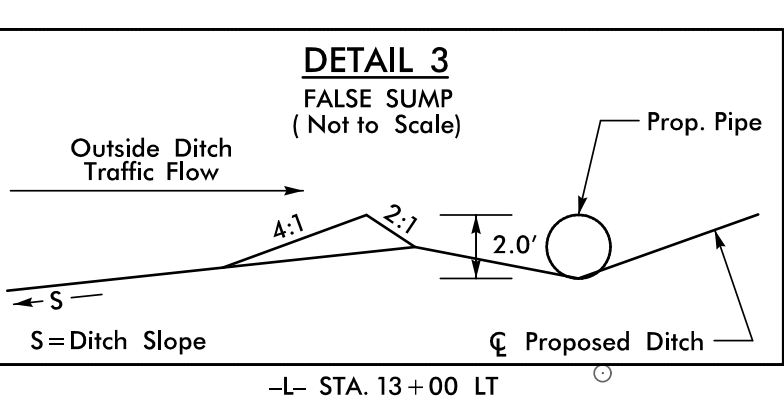
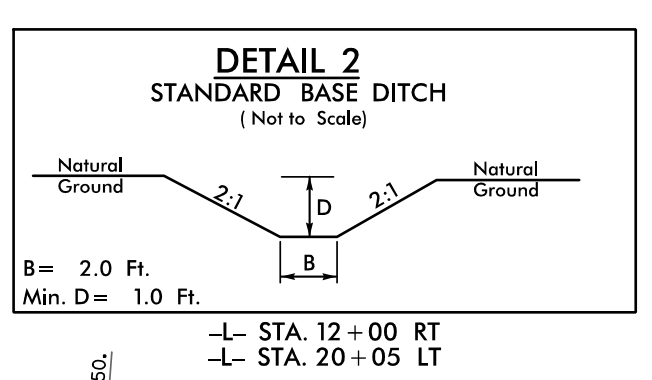
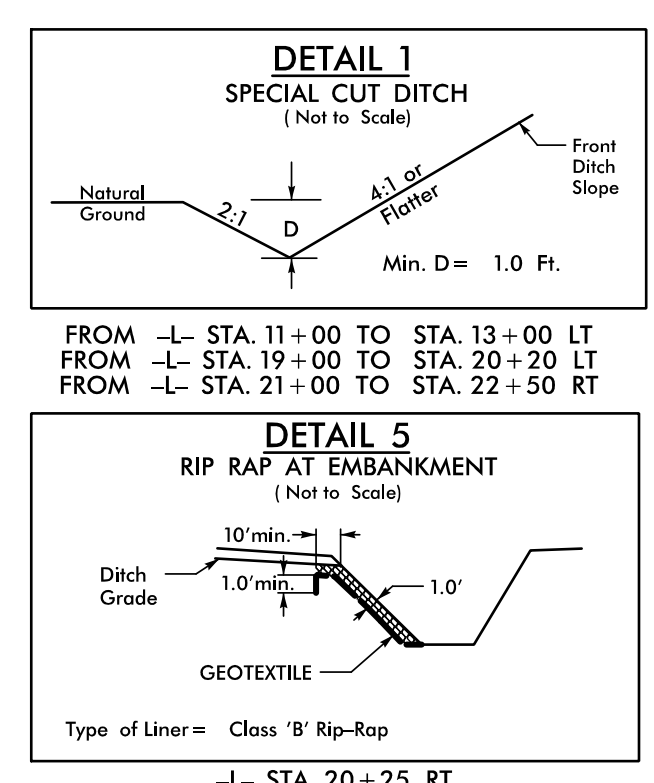
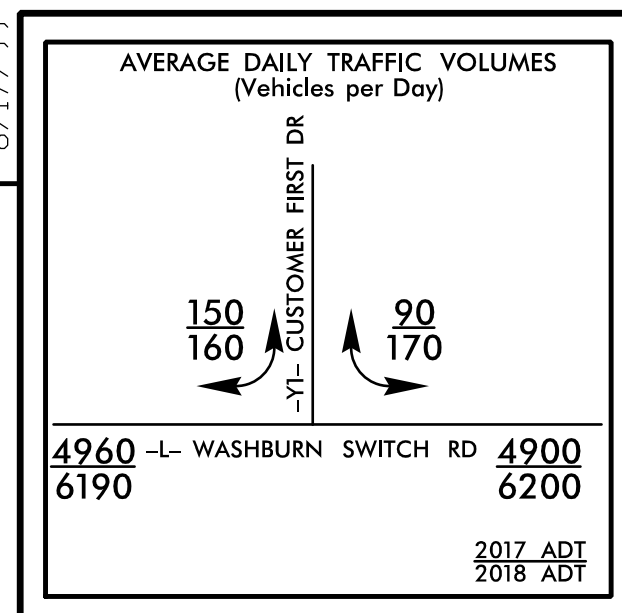
LINE	Station	Station	MONTHS

**SUMMARY OF BRIDGE WAITING PERIODS**

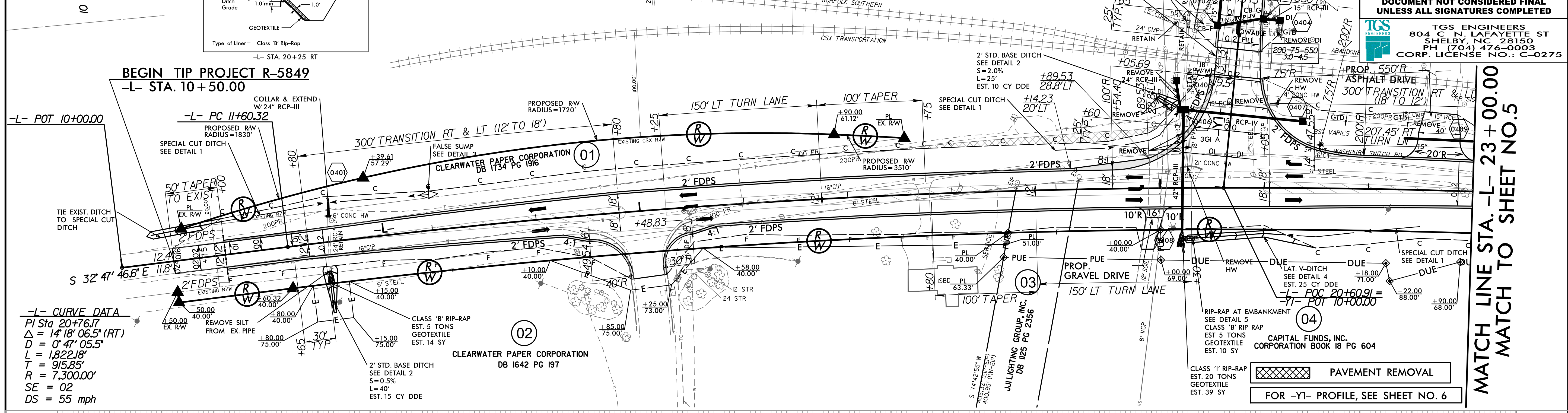
Bridge Description	End Bent/ Bent No.	MONTHS



PROJECT REFERENCE NO. R-5849	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
SEAL 35018	SEAL 044158
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

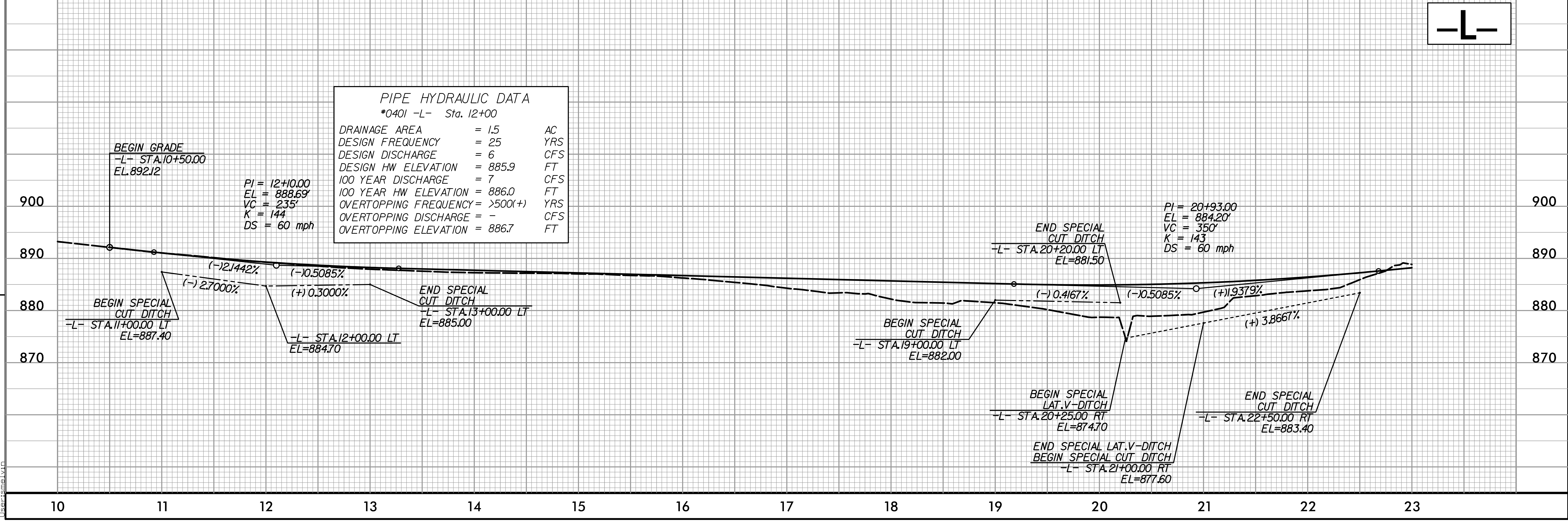


MATCH LINE STA. -Y1- 12+00.00  
MATCH TO SHEET NO.6



-L- CURVE DATA  
PI Sta 20+76.17  
 $\Delta = 14' 18" 06.5" (RT)$   
D = 0' 47" 05.5"  
L = 1,822.18'  
T = 915.85'  
R = 7,300.00'  
SE = 02  
DS = 55 mph

PIPE HYDRAULIC DATA	
*0401 -L- Sta. 12+00	
DRAINAGE AREA	= 1.5 AC
DESIGN FREQUENCY	= 25 YRS
DESIGN DISCHARGE	= 6 CFS
DESIGN HW ELEVATION	= 885.9 FT
100 YEAR DISCHARGE	= 7 CFS
100 YEAR HW ELEVATION	= 886.0 FT
OVERTOPPING FREQUENCY	= >500(+) YRS
OVERTOPPING DISCHARGE	= - CFS
OVERTOPPING ELEVATION	= 886.7 FT



-L-

MATCH LINE STA. -L- 23+00.00  
MATCH TO SHEET NO.5

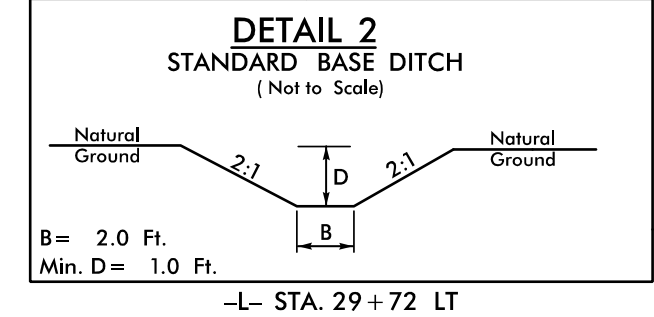
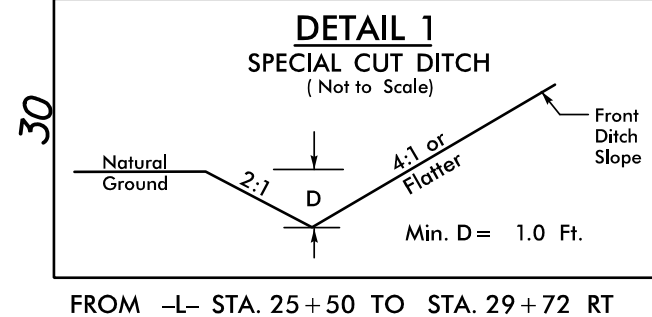
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8/17/17

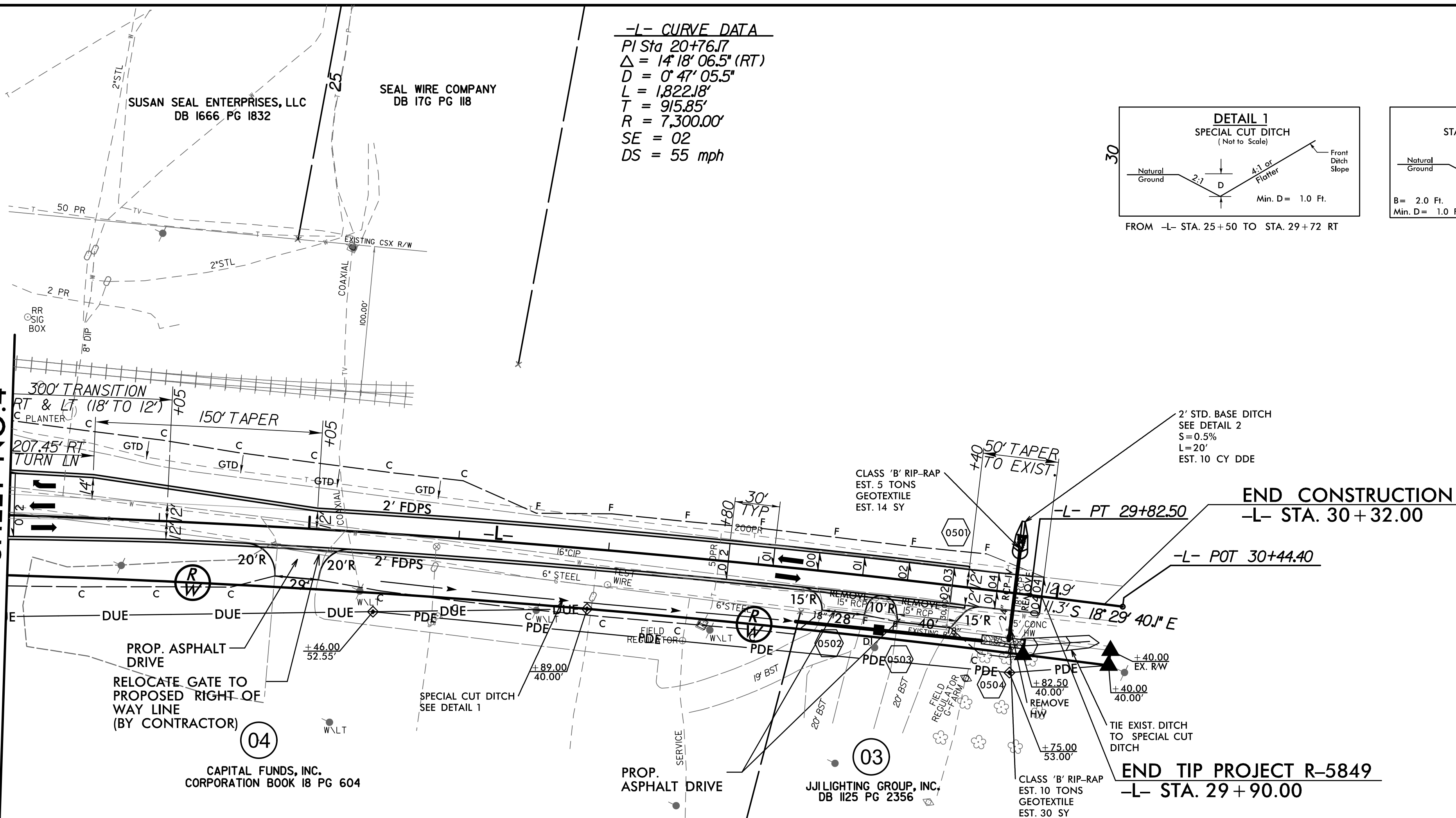
PROJECT REFERENCE NO. R-5849	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER SEAL 35018	HYDRAULICS ENGINEER SEAL 044158
<p><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p> <p>TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275</p>	

**-L- CURVE DATA**  
 PI Sta 20+76.17  
 $\Delta = 14^\circ 18' 06.5''$  (RT)  
 $D = 0^\circ 47' 05.5''$   
 $L = 1,822.18'$   
 $T = 915.85'$   
 $R = 7,300.00'$   
 $SE = 02$   
 $DS = 55$  mph



NAD 83/2011

MATCH LINE STA. -L- 23+00.00  
 MATCH TO SHEET NO. 4

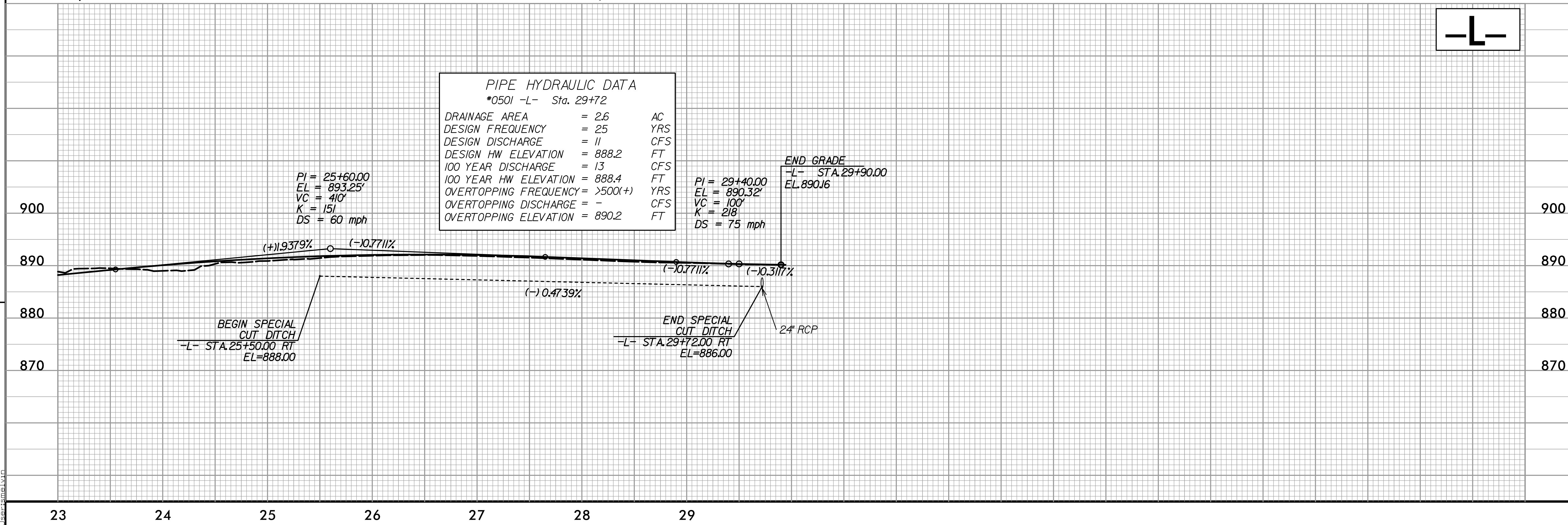


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-L-

**PIPE HYDRAULIC DATA**  
 \*0501 -L- Sta. 29+72

DRAINAGE AREA	= 2.6	AC
DESIGN FREQUENCY	= 25	YRS
DESIGN DISCHARGE	= 11	CFS
DESIGN HW ELEVATION	= 888.2	FT
100 YEAR DISCHARGE	= 13	CFS
100 YEAR HW ELEVATION	= 888.4	FT
OVERTOPPING FREQUENCY	= >500(+)	YRS
OVERTOPPING DISCHARGE	= -	CFS
OVERTOPPING ELEVATION	= 890.2	FT

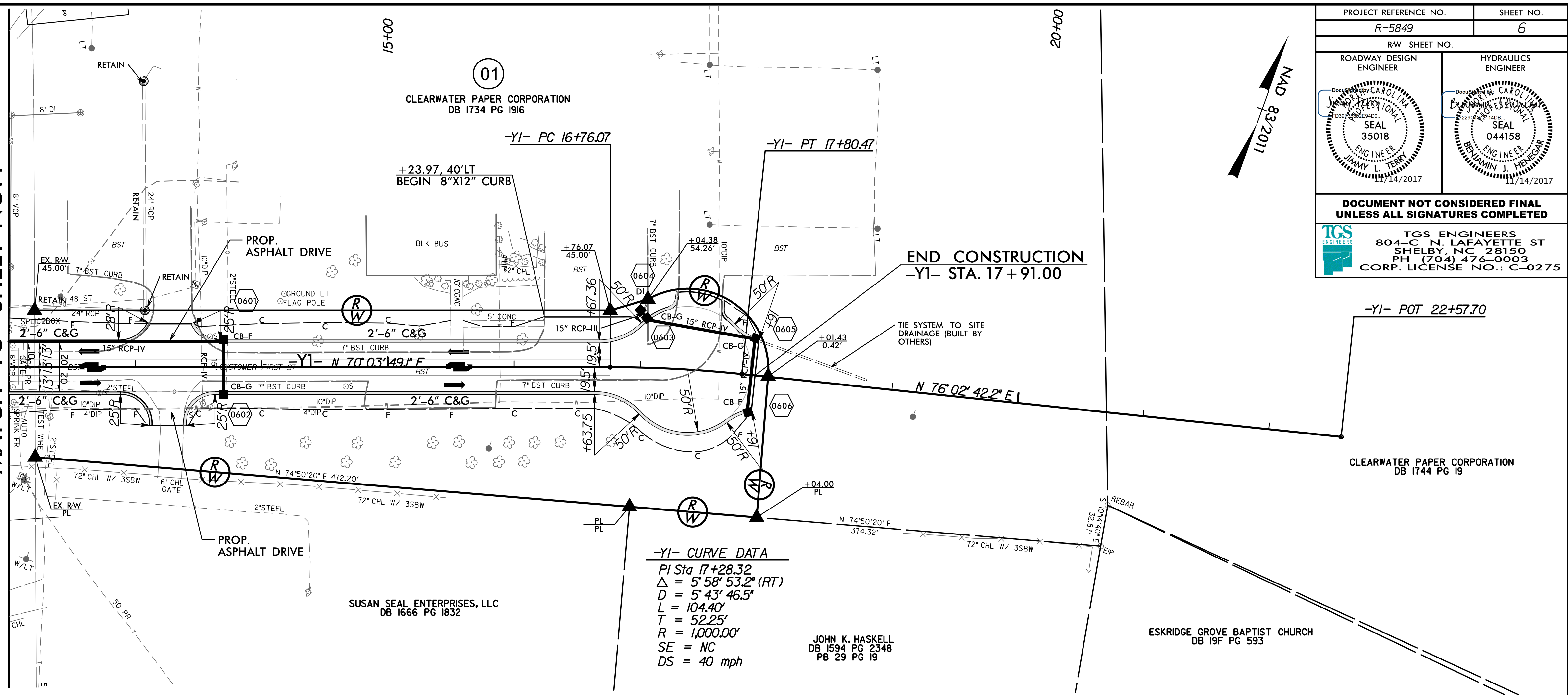


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 11/14/2017

8/17/17

PROJECT REFERENCE NO. R-5849		SHEET NO. 6	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			
TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275			

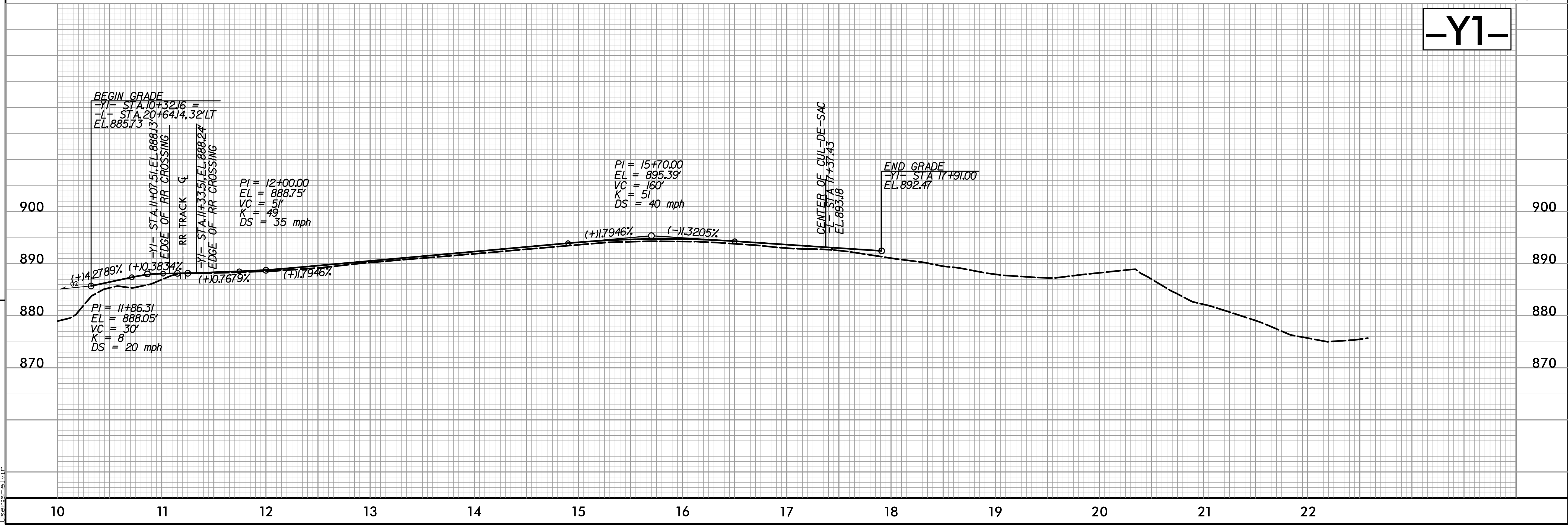
MATCH LINE STA. -Y1- 12+00.00  
MATCH TO SHEET NO.4



**-Y1- CURVE DATA**  
 PI Sta 17+28.32  
 $\Delta = 5^{\circ}58'53.2\"$  (RT)  
 $D = 5^{\circ}43'46.5\"$   
 $L = 104.40'$   
 $T = 52.25'$   
 $R = 1,000.00'$   
 $SE = NC$   
 $DS = 40$  mph

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-Y1-

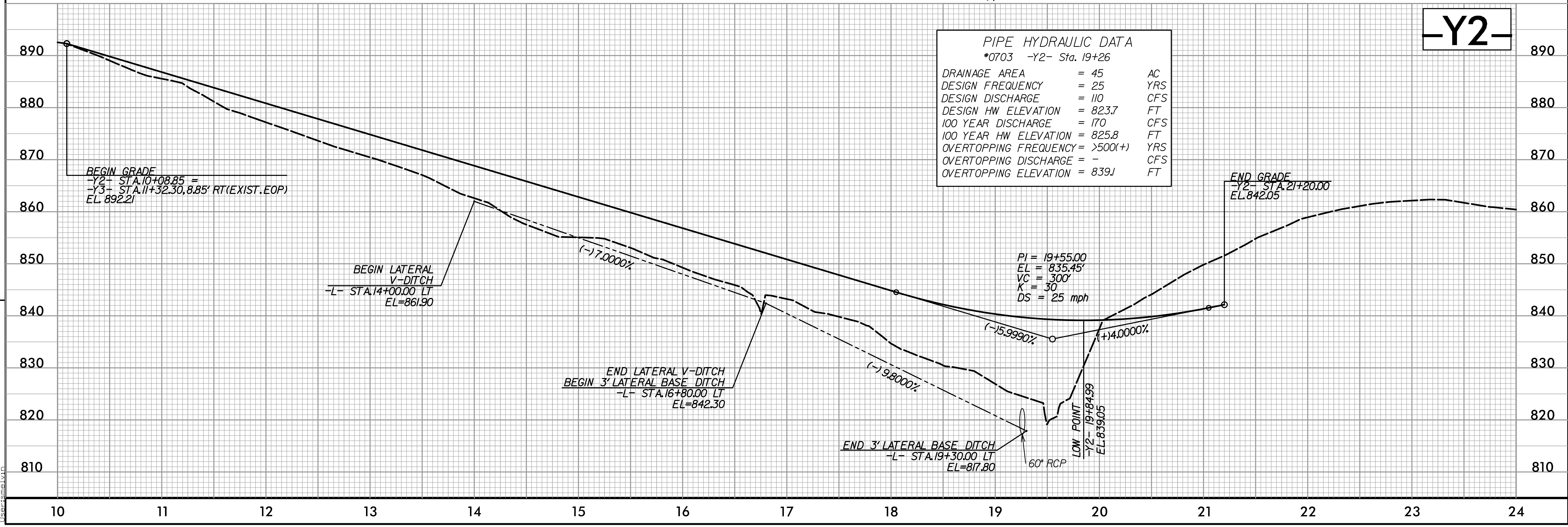
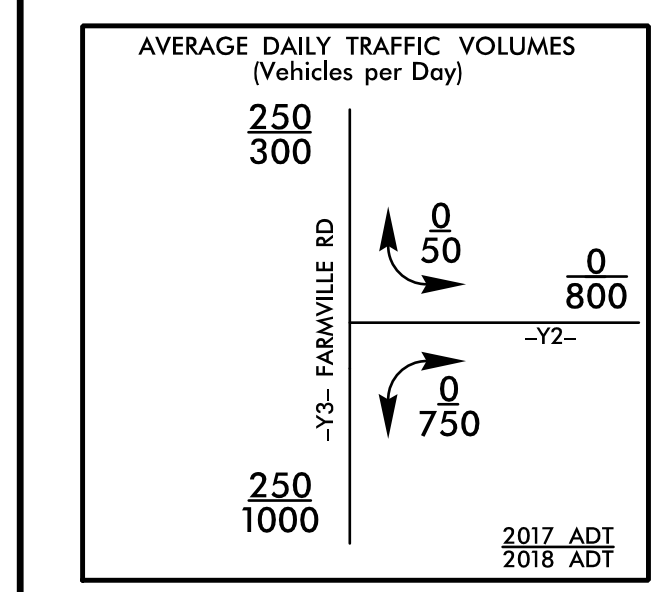
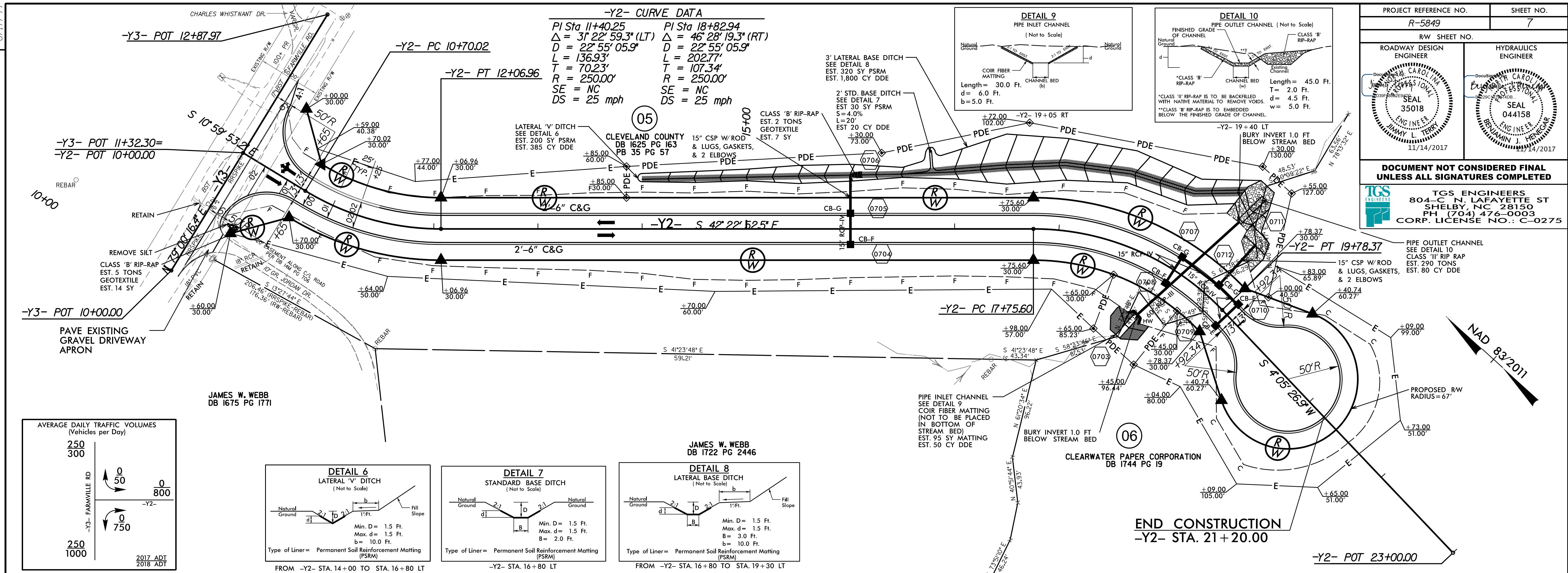


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PROJECT REFERENCE NO. R-5849	SHEET NO. 7
ROADWAY DESIGN ENGINEER JIMMY L. TERRY SEAL 35018 11/14/2017	HYDRAULICS ENGINEER BENJAMIN J. HENNINGER SEAL 044158 11/14/2017

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

TGS ENGINEERS  
804-C N. LAFAYETTE ST  
SHELBY, NC 28150  
PH: (704) 476-0003  
CORP. LICENSE NO.: C-0275



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 1/14/2017  
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